25X1

PAR 210

1 June 64

SUBJECT: Lamination of Glass Slides

TASK/PROBLEM

1. Develop an inexpensive piece of equipment and/or technique to laminate or mount film to prevent buckling when film is used with a Teleprompter projector.

DISCUSSION

2. During the early part of the report period, a lamination press was received and the development of slide lamination processes were initiated.

3. Successful bonding between a film print and a glass slide has been achieved by the use of gelatin as the bonding media. A variety of techniques were explored. The following two methods are the most promising:

a. Gel Pre-Coated Glass Plates - Glass plates are purchased pre-coated with gelatin. Just prior to the film lamination, the gelatin surface of the glass plate is flooded with 40 - 50% alcohol water mixture. After approximately a 1/2-minute gelatin softening time, the film is laminated to the gelatin coated glass plate in the lamination press. The laminated slide is removed from the press and excess liquid removed. After drying on a heated (approximately 90°) surface, the film is trimmed and the slide is rewashed if necessary. From the results of limited testing, drying time is an important process parameter which effects the quality of the projected slide image. The following observations were noted in respect to the formation of bubbles in laminated slides:

(1) Projection of slides within one-hour after lamination may cause the formation of microscopic bubbles.

(2) Projection, after 24 hours of drying, results in a fully set lamination without the presence of bubbles.

b. Gel Cementing Film to Glass - A liquid gelatin cement (consisting of gelatin, water, alcohol, ammonium hydroxide and photo-flo) is applied to a glass plate. The cement is applied with a syringe so that a bead is formed between the leading edge of the film and the glass plate. The film is laminated to the glass plate so that the bead of cement is always present at the point of contact of the film and glass, thereby excluding air.

4. In both of the above lamination processes, care must be exercised to insure

a. That the gelatin mixute is free from air bubbles before application.

b. That air bubbles do not get trapped between the film and the glass during the rolling operation.

5. A telepromter projector was received and has been operated to test the durability of the film-to-glass bond. The projector was modified slightly to improve slide cooling. Before modifications, temperature measurements of the slide in the Teleprompter projector indicated a surface temperature of 240F. By repositioning the internal blower and adding an air-deflecting cover in the front end of the air chamber, the slide temperature was reduced to about 200F. The addition of the external blower has further reduced this temperature to about 120°. This temperature appears low enough to permit indefinite projection of slides without damage.

6. During the later part of April, a visit was made by a customer's representative for the purpose of observing and commenting on the project's progress.

7. Preparation of a final report and operating instructions are in progress.

PLANNED ACTIVITY

8. Before 1 July, the final report and the prototype equipment, including the TelePro Projector, will be submitted.